**Upcoming assessments:**
Friday, October 16 - Quiz on 2.2 - 2.4
Tuesday, October 27 - Quest on Polynomial lessons (2.1 - 2.6)

**Required assignments:**

1. Complete minimum circled questions on 2.5A homework (due Thursday, October 15)
2. Create a personal study guide of key notes for 2.1 - 2.4 (due Thursday, October 15)

**Optional assignments:**

1. Complete the work on synthetic division (see shared group document)
2. Extra practice problems on Lesson 2.5A homework
3. Find and watch a video tutorial for a topic in Unit 2, post it to the shared group document

**Personal Study Guide**

- this guide must be written and should be separate from your notes from class
- At a minimum it should include answers to the **following**:
    - How do I factor trinomials in the form $ax^2 + bx + c$?
    - How do I factor trinomials in the form $ax^2 + bx + c$ using the grouping method?
    - **How do I factor special patterns? (Difference of squares, Difference of cubes, Sum of cubes)**
    - **How do I tell if a function is a polynomial?**
    - **How do I sketch a graph of a polynomial?**
    - **How do I write a possible factored form equation given a graph?** How do I apply that to different situations (such as a table?)
    - **How do I multiply out a factored form equation into standard form?**
    - Key vocabulary - polynomial, root, zero, multiplicity, end behavior, leading coefficient, turning points
- Extra:
    - Do I still know how to I graph quadratics, find the vertex and axis of symmetry, write the exact equation from a graph, etc or should I review that as well?

## Long Division of Polynomials

1. Arrange the terms of both the dividend and the divisor in descending powers of any variable.
2. **Divide** the first term in the dividend by the first term in the divisor. The result is the first term of the quotient.
3. **Multiply** every term in the divisor by the first term in the quotient. Write the resulting product beneath the dividend with like terms lined up.
4. **Subtract** the product from the dividend.
5. **Bring down** the next term in the original dividend and write it next to the remainder to form a new dividend.
6. Use this new expression as the dividend and repeat this process until the remainder can no longer be divided. This will occur when the degree of the remainder (the highest exponent on a variable in the remainder) is less than the degree of the divisor.

At a minimum, complete the circled problems.

*In Exercises 1–16, divide using long division. State the quotient, $q(x)$, and the remainder, $r(x)$.*

1. $(x^2 + 8x + 15) \div (x + 5)$
2. $(x^2 + 3x - 10) \div (x - 2)$
3. $(x^3 + 5x^2 + 7x + 2) \div (x + 2)$
4. $(x^3 - 2x^2 - 5x + 6) \div (x - 3)$
5. $(6x^3 + 7x^2 + 12x - 5) \div (3x - 1)$
6. $(6x^3 + 17x^2 + 27x + 20) \div (3x + 4)$
7. $(12x^2 + x - 4) \div (3x - 2)$
8. $(4x^2 - 8x + 6) \div (2x - 1)$
9. $\dfrac{2x^3 + 7x^2 + 9x - 20}{x + 3}$
10. $\dfrac{3x^2 - 2x + 5}{x - 3}$
11. $\dfrac{4x^4 - 4x^2 + 6x}{x - 4}$
12. $\dfrac{x^4 - 81}{x - 3}$
13. $\dfrac{6x^3 + 13x^2 - 11x - 15}{3x^2 - x - 3}$
14. $\dfrac{x^4 + 2x^3 - 4x^2 - 5x - 6}{x^2 + x - 2}$
15. $\dfrac{18x^4 + 9x^3 + 3x^2}{3x^2 + 1}$
16. $\dfrac{2x^5 - 8x^4 + 2x^3 + x^2}{2x^3 + 1}$